What is claimed is:

1. A method for processing an optical communications signal comprising the steps of:

coupling at least one first-optical signal into a primary-first-optical circulator input of a first-optical circulator;

splicing a primary-first-optical-circulator output port to a first 50:50 coupler input port of a 50:50 coupler;

employing a secondary-first-optical circulator output port of said first optical circulator as a first-optical fiber output port of said 50:50 coupler;

splicing a primary-second-optical circulator output port to a second 50:50 coupler input port of said 50:50 coupler;

employing a secondary-second-optical circulator output port as a second-optical fiber output port;

splicing a first 50:50 coupler output port to a first optical fiber, having a first optical fiber length, which is terminated with a first reflector that returns any optical signals back toward said 50:50 coupler;

splicing a second 50:50 coupler output port to a second optical fiber, having a second length, which is terminated with a second reflector that returns any optical signals back toward said 50:50 coupler, said first and second reflectors having substantially the same reflection properties;

interfering reflected signals from said first and second reflectors as they pass back through said 50:50 coupler;

allowing interference products of said reflected signals to propagate back toward said first and second optical circulators, which direct said interference products to said first and second optical fiber output ports; and

controlling said first and second fiber lengths and the properties of said reflectors so as to accomplish the desired optical processing in a manner that is resistant to varying environmental influences.

2. The method for processing an optical communications signal as recited in claim 1, further comprising the steps of:

coupling at least one second optical signal into a primary-second-optical circulator input of said second optical circulator, wherein said first and second optical circulators have substantially the same propagation characteristics.

3. The method for processing an optical communications signal as recited in claim 1, wherein said step of allowing comprises allowing interference products of said reflected signals to propagate back toward said first and second optical circulators, which direct said interference products to said first and second optical-fiber outputs.

4. The method for processing an optical communications signal as recited in claim 1, wherein said reflectors are Faraday rotator-mirrors.

5. The method for processing an optical communications signal as recited in claim 2, wherein said reflectors are Faraday rotator-mirrors.

6. The method for processing an optical communications signal as recited in claim 1, wherein the step of controlling said first and second fiber lengths comprises using a heating element to tune said fiber lengths.

7. The method for processing an optical communications signal as recited in claim 2, wherein the step of controlling said first and second fiber lengths comprises using a heating element to tune said fiber lengths.

8. The method for processing an optical communications signal as recited in claim 1, utilized as a DPSK demodulator.

9. The method for processing an optical communications signal as recited in claim 2, utilized as a wavelength division multiplexer / demultiplexer.

10. The method for processing an optical communications signal as recited in claim 1, utilized as an optical switch.

11. An apparatus for processing an optical communications signal comprising:

a first optical circulator having a primary-first-optical circulator input, a primary-first-optical circulator output, and a secondary-first-optical circulator output, said primary-first-optical circulator input receiving at least one first optical signal, said secondary-first-optical circulator output port spliced to a first-optical fiber output port;

a second optical circulator having a primary-second-optical circulator input, a primary-second-optical circulator output, and a secondary-second-optical circulator output, said secondary-second-optical circulator output port spliced to a second-optical fiber output port;

a 50:50 coupler having a first 50:50 coupler input port, a second 50:50 coupler input port, a first 50:50 coupler output port, and a second 50:50 coupler output port, said first 50:50 coupler input port spliced to said primary-first-optical circulator output, and said second 50:50 coupler input port spliced to said primary-second optical circulator output;

a first optical fiber, having a first optical fiber length coupled to said first 50:50 coupler output port;

a first reflector terminating said first optical fiber and returning any optical signals back toward said 50:50 coupler;

a second optical fiber, having a second optical fiber length coupled to said second 50:50 coupler output port;

a second reflector terminating said second optical fiber and returning any optical signals back toward said 50:50 coupler, said first and second reflectors having substantially the same reflection properties;

wherein said 50:50 coupler interferes reflected signals from said first and second reflectors as they pass back through said 50:50 coupler, thereby allowing interference products of said reflected signals to propagate back toward said first and second optical circulators, which direct said interference products to said first and second optical fiber output ports; and

a mechanism coupled to said second optical fiber, said mechanism controlling said second fiber length so as to accomplish the desired optical processing in a manner that is resistant to varying environmental influences.

12. The apparatus for processing an optical communications signal as recited in claim 11, wherein said second optical circulator includes a primary-second-optical circulator input, said primary-second-optical circulator input receiving at least one second optical signal.

13. The apparatus for processing an optical communications signal as recited in claim 12, utilized as a wavelength division multiplexer / demultiplexer.

14. The apparatus for processing an optical communications signal as recited in claim 11, wherein said mechanism comprises a heating element.

15. The apparatus for processing an optical communications signal as recited in claim 12, wherein said mechanism comprises a heating element.

16. The apparatus for processing an optical communications signal as recited in claim 11, wherein said reflectors are Faraday rotator-mirrors.

17. The apparatus for processing an optical communications signal as recited in claim 12, wherein said reflectors are Faraday rotator-mirrors.

18. The apparatus for processing an optical communications signal as recited in claim 11, utilized as a DPSK demodulator.

19. The apparatus for processing an optical communications signal as recited in claim 11, utilized as an optical switch.

20. A satellite communications system for processing an optical communications signal comprising:

a first satellite in orbit;

a second satellite in orbit and in communication with said first satellite, said second satellite including an apparatus for processing an optical communications signal comprising;

a first optical circulator having a primary-first optical circulator input, a primary-first-optical circulator output, and a secondary-first-optical circulator output, said primary-first-optical circulator input receiving at least one first-optical signal, said secondary-first-optical circulator output port spliced to a first-optical fiber output port;

a second-optical circulator having a primary-second-optical-circulator input, a primary-second-optical circulator output, and a secondary-second-optical circulator output, said secondary-second-optical circulator output port spliced to a second-optical fiber output port;

a 50:50 coupler having a first 50:50 coupler input port, a second 50:50 coupler input port, a first 50:50 coupler output port, and a second 50:50 coupler

output port, said first 50:50 coupler input port spliced to said primary-first-optical circulator output, and said second 50:50 coupler input port spliced to said primary-second-optical circulator output;

a first optical fiber, having a first optical fiber length coupled to said first 50:50 coupler output port

a first reflector terminating said first optical fiber and returning any optical signals back toward said 50:50 coupler;

a second optical fiber, having a second optical fiber length coupled to said second 50:50 coupler output port;

a second reflector terminating said second optical fiber and returning any optical signals back toward said 50:50 coupler, said first and second reflectors having substantially the same reflection properties;

wherein said 50:50 coupler interferes reflected signals from said first and second reflectors as they pass back through said 50:50 coupler, thereby allowing interference products of said reflected signals to propagate back toward said first and second optical circulators, which direct said interference products to said first and second optical fiber outputs; and

a mechanism coupled to said second optical fiber, said mechanism controlling said second fiber length so as to accomplish the desired optical processing in a manner that is resistant to varying environmental influences.

21. The system for processing an optical communications signal as recited in claim 20, wherein said second optical circulator includes a primary-second-optical circulator input, said primary-second-optical circulator input receiving at least one second optical signal.

22. The system for processing an optical communications signal as recited in claim 21, wherein said apparatus is utilized as a wavelength division multiplexer / demultiplexer.

23. The system for processing an optical communications signal as recited in claim 20, wherein said reflectors are Faraday rotator-mirrors.

24. The system for processing an optical communications signal as recited in claim 21, wherein said reflectors are Faraday rotator-mirrors.

25. The system for processing an optical communications signal as recited in claim 20, wherein said mechanism comprises a heating element.

26. The system for processing an optical communications signal as recited in claim 21, wherein said mechanism comprises a heating element.

27. The system for processing an optical communications signal as recited in claim 20, utilized as a DPSK demodulator.

28. The system for processing an optical communications signal as recited in claim 20, wherein said apparatus is utilized as an optical switch.

29. A satellite communications system for processing an optical communications signal comprising:

a satellite in orbit;

a ground based communication station in communication with said satellite, said ground based communication including an apparatus for processing an optical communications signal comprising;

a first-optical circulator having a primary first-optical circulator input, a primary-first-optical circulator output, and a secondary-first-optical circulator

output, said primary-first-optical circulator input receiving at least one first-optical signal, said secondary-first-optical circulator output port spliced to a first-optical fiber output port;

a second-optical circulator having a primary-second-optical circulator input, a primary-second optical circulator output, and a secondary-second-optical circulator output, said secondary-second-optical circulator output port spliced to a second-optical fiber output port;

a 50:50 coupler having a first 50:50 coupler input port, a second 50:50 coupler input port, a first 50:50 coupler output port, and a second 50:50 coupler output port, said first 50:50 coupler input port spliced to said primary-first-optical circulator output, and said second 50:50 coupler input port spliced to said primary-second-optical circulator output;

a first optical fiber, having a first optical fiber length coupled to said first 50:50 coupler output port

a first reflector terminating said first optical fiber and returning any optical signals back toward said 50:50 coupler;

a second optical fiber, having a second optical fiber length coupled to said second 50:50 coupler output port;

a second reflector terminating said second optical fiber and returning any optical signals back toward said 50:50 coupler, said first and second reflectors having substantially the same reflection properties;

wherein said 50:50 coupler interferes reflected signals from said first and second reflectors as they pass back through said 50:50 coupler, thereby allowing interference products of said reflected signals to propagate back toward said first and second optical circulators, which direct said interference products to said first and second optical fiber outputs; and

a mechanism coupled to said second optical fiber, said mechanism controlling said second fiber length so as to accomplish the desired optical processing in a manner that is resistant to varying environmental influences.

30. The system for processing an optical communications signal as recited in claim 29, wherein said second-optical circulator includes a primary-second-optical circulator input, said primary-second-optical circulator input receiving at least one second optical signal.

31. The system for processing an optical communications signal as recited in claim 30, wherein said apparatus is utilized as a wavelength division multiplexer / demultiplexer.

32. The system for processing an optical communications signal as recited in claim 29, wherein said reflectors are Faraday rotator-mirrors.

33. The system for processing an optical communications signal as recited in claim 30, wherein said reflectors are Faraday rotator-mirrors.

34. The system for processing an optical communications signal as recited in claim 29, wherein said mechanism comprises a heating element.

35. The system for processing an optical communications signal as recited in claim 30, wherein said mechanism comprises a heating element.

36. The system for processing an optical communications signal as recited in claim 29, utilized as a DPSK demodulator.

37. The system for processing an optical communications signal as recited in claim 29, wherein said apparatus is utilized as an optical switch.